APPENDIX A

```
<!--

  Pixxa Exchange Protocol XML DTD
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-->

<!-- ================================================== introduct
ion -->

<!--

  This document specifies the Pixxa Exchange Protocol (PXP), a
  communication protocol for synchronizing a collection of items i
n two
  independent agents. Pixxa Exchange Protocol builds on top of
  standard transport protocols (TCP/IP, HTTP) and encodings (XML,
GIF,
  JPEG, URL, and MIME standards.)

  The Pixxa system consists of:
    users
    media items

  Each user has:
    id (or a username)
    collection of items

  Each media item has:
    id: used for identity comparison
    name: short name of the object
    content: where the content of this media item resides,
         e.g., the src of the IMG tag
    contenttype: what is the mime type for this item. For now,
        assume it is image/jpeg image/gif
    title: the title screen displayed for this item
    page: the source page where we got this item
    details: the fine print on this item, e.g., copyright info on
images

  The goal of the Pixxa Exchange Protocol is to have the client an
d
  the server share the same "knowledge" as to
  the items in the collection for a particular user. The client an
d
  server should be able to operate with a partial collection at an
y
  time. Note that the media in a collection may not reside on
  the Pixxa server; they may be anywhere on the Internet.

  A media item may be 'materialized' which means that its content
has
  been copied to the client-side cache. The client-side cache is
  persistent across restarts of the client. Note that the same use
r
  may have a client on multiple machines; these will effectively b
e
  replicated but they may have different media items materialized.

  A sound sameness criteria for media items will be difficult to
  define formally, especially across different formats. For now, w
e
  assume that each media item has a unique id. Ultimately, we woul
d
  like collections to be true sets where only one instance of the
same
  media item exists. Somewhere along the two ends of the spectrum
lies
  the approach of using some form of fingerprints for media item
  equality. (Obviously we don't want to compare the entire bits of
  media items.)

  Each media item has a 'preference rating' which describes how we
ll
  the user likes that media item:

       0        => ambivalent or unrated (don't care)
       positive  => like
       negative => dislike

  Each media item starts with zero rating.  Items may be promoted
(or
  demoted) by the user which increases (or decreases) their prefer
ence
  rating by one unit. Items with negative rating do not get displa
yed
```

```
  on the client unless explicitly requested. The higher the rating
 of
  the media item the more frequently it is displayed.

  This rating information is implicitly communicated as normal par
t of
  PXP's operation.

-->


<!-- ============================================================ con
ventions -->
<!--

  Section tags, such as "rendezvous", use long names whereas item
tags, such as
  item-ref, use short names.

  Tags usually end in:

    -ref  a reference to something; this is a form of declaration
to
          let the other side know that this object lives on this s
ide.

    -def  a definition of something, usually result of a -req from

          the other side. Sometimes client or server voluntarily
          define something, e.g., username and password.

    -req  a request for something, the other side should send it n
ext time

-->

<!-- ========================================================= protoc
ol basics -->

<!--

  Pixxa client and server communicate via HTTP POST requests
  and HTTP responses carrying XML documents conforming to the
```

PXP XML DTD.

A typical interaction between the client and server is as follow
s:

```
        Client                                      Server

        0.              >>>> empty rendezvous >>>>>>

        1.                   rendezvous info, <<<<<<
                             email,passwd req.
                        <<<< generic matches

        2.              >>>> rendezvous info,
                             email, passwd def
                             like/dislikes    >>>>>>

        3.                   rendezvous info, <<<<<<
                             latest matches,
                        <<<< schema changes

        4.              >>>> rendezvous info,
                            like/dislikes     >>>>>>

        5.                   rendezvous info, <<<<<<
                             latest matches,
                        <<<< schema changes

                        .... repeat 4 and 5 ......
```

Explanation:

0. A fresh client sends empty rendezvous to the server when it gets started.

1. The server requests authorization information (email, passswo
rd)
and sends back some generic matches (since it doesn't yet kno
w
who the client is.)

2. The client will pass back userid and password, and maybe some like dislikes.

```
  3. The server will send back a set of changes for the latest mat
ches
     to the client in response to this request. In case the system
 has
     had any schema changes (i.e., media items which have been del
eted or
     modified) the changes are also communicated. Finally, through
 the
     rendezvous info, the server also tells the client when to
     contact it again and what the client needs to present to the
server.

  4. The client sends the latest likes and dislike sets, including

     the rendezvous info it got form the server.

  5. Repeat steps 4 and 5.

-->

<!-- ===================================================- pxp: exc
hange unit -->

<!--
  A PXP transmission is a kind of rendezvous by two agents; the
  goal of the agents is to synchronize their information about som
e
  external resources (such as media instances on the internet.)

  During the rendezvous, the each side exchanges information about
  its state and requests information to be sent in the next
  rendezvous. PXP is designed to allow agents to progress
  independently with coarse communication that are few and far in
  between.

  A complete rendezvous is a result of two PXP messages, a request
 by
  a client is satisifed with a response from the server. Both clie
nt
  and server use PXP to exchange the information, each carrying
  information about the changes in the collection. Each
  rendezvous is tied to the next one because the server issues a
  rendezvous ticket which can be used for a certain period of time
.

-->

<!ELEMENT pxp (rendezvous?, variables?, special?, instances?, repo
rts?)>

<!ATTLIST pxp version      NMTOKEN    #IMPLIED
              role         (client|server|provider|archive) "provi
der">

<!--

  A pxp message may include:

        version         version information, currently 3.1

        role            whether the message is sent by an agent
                        taking on a client or server role.

        rendezvous      information on the last rendezvous

        variables       variable binding requests and responses

        special         meta-information about client's collection

        instances       requests for actions that should be perfor
med
                        by the other side on instances, e.g., inse
rtion
                        and deletion

        reports         briefs the other side about what happened
                        during various actions, for example,
                        whether certain media items could not be
                        accessed.

  A pxp message can carry information that have different but simi
lar
  roles. Eventually there may be multiple, related definitions for
  these roles but for simplicity we will embed them in the same
```

```
definition for now.

      server            an active server which manages pxp
                        information from various places. This
                        mode is used for server communicating
                        back to the client.

                        pxp role="server"
                          rendezvous
                            rz-def
                          variables
                            var-req
                          special
                            var-def
                          instances
                            inserts
                            deletes
                            updates
                            defines

      client            client that merely views and marks items.
                        This mode is used for client communicating
                        to the server. The following tags are
                        legal in client role:

                        pxp role="client"
                          rendezvous
                            rz-ref
                          variables
                            var-def
                          reports
                            rprt-def

      provider          a content provider, for example,
                        a site that has some gifs and wants
                        to create a collection from them
                        without involving the server extensively.

                        pxp role="provider"
                          special
                            var-def
                          instances
                            defines
```

```
        archive        an archive file, for example, saved
                       by the client in between client sessions.
                       For uniformity, archive files use a dialect
                       of the protocol to ease interoperability.

                        pxp role="archive"
                          rendezvous
                            rz-def
                          variables
                            var-def
                            var-ref
                          special
                            var-def
                          reports
                            rprt-def
                          instances
                            inserts
                            deletes
                            updates
                            defines

-->

<!-- ========================================================= ren
dezvous -->

<!ELEMENT rendezvous ( rz-def | rz-ref )? >

<!ELEMENT rz-def EMPTY >
<!ATTLIST rz-def host          NMTOKEN #IMPLIED
                 time          CDATA   #REQUIRED
                 delaymin      NMTOKEN #IMPLIED
                 delaymax      NMTOKEN #IMPLIED
                 ticket        NMTOKEN #REQUIRED>

<!ELEMENT rz-ref EMPTY >
<!ATTLIST rz-ref ticket NMTOKEN #REQUIRED
                 time   CDATA   #IMPLIED
                 info   CDATA   #REQUIRED>

<!--
```

```
    The rendezvous statement specifies the timing of the
    communication between client and the server. Obviously, clients
  can
    access servers at will, as they do in HTTP.  However, this
    rendezvous mechanism allows the server to manage its resources
    (bandwidth, processor time, and memory) by adjusting how often
 a
    client makes accesses to the server.

    A rendezvous record either is either defined by server in order
  to
    communicate the next time the client should try approaching the
    server (rz-def), or defined by a client to specify when the
    last rendezvous was (rz-ref). Rendezvous info includes:

       host      where to go for the next rendezvous

       time      the current server time using HTTP format
                 e.g., 14 January 2000 12:22:33 EST

       delaymin  the minimum time to wait before contacting the ser
 ver

       delaymax  the maximum time to wait before contacting the ser
 ver

       ticket    present this at the next rendezvous

       info      miscellaneous variable bindings sent by the client
 ,
                 including "uptime= ", where uptime is the time in
                 seconds since the client started up

   A "fresh" client may pass an empty rendezvous statement to the
   server (i.e., <rendezvous></rendezvous> to denote that it doesn'
 t
   have any previous rendezvous information.)

 -->


 <!-- ================================================== var
```

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iables -->

<!ELEMENT variables ( (var-def | var-req) * ) >

<!--

   Variables statements request variable bindings, passing the
   required information for a dialog (var-req, usually done by the
   server) or for the binding for a variable to come back (var-def
.)

   Each response from the server may carry one or more variable
   requests, which turn to dialog displays for a client.  Each dia
log
   is marked with the rendezvous information passed down when the
   server initially requested the dialog. The client will prompt t
he
   user with this dialog. If the user responds in the specified pe
riod
   of time, the user's response is sent to the server in the next
   rendezvous.

   If the user doesn't respond to a dialog, the corresponding dial
og
   response is not sent to the server. If this dialog response is
crucial
   for server operation (for example, a confirmation password of a
 newly
   registered user), it may respond back again for the same prompt
. This
   process is continued until the requested information is supplie
d.

-->

<!ELEMENT var-def EMPTY >
<!ATTLIST var-def var   CDATA   #REQUIRED
                  val   CDATA   #REQUIRED>

<!ELEMENT var-req EMPTY>
<!ATTLIST var-req  var          CDATA           #REQUIRED
                   default      CDATA           #IMPLIED
                   prompt       CDATA           #IMPLIED
```

```
                details      CDATA          #IMPLIED
                delay        NMTOKEN        #IMPLIED
                type         (text|password|inform|confirm)
                                            'text' >


<!--
   A var-def binds the value of a variable. Its attributes are:

        var     name of the variable
        val     the value for a variable

   Var-defs from the client are usually the result of a previous
   var-req by the server. However, this may not always be the case
;
   the protocol allows for variables to be bound voluntarily by th
e
   client (for example, to pass runtime platform info.)

   A var-req requests a new variable to be assigned:

        var     name of the variable

        default the default value for the variable

        prompt  a short (one or two word) prompt, e.g., Username

        details the fine print for the question

        delay   how long should the question be displayed

        type    hint for the client as to how it should gather the
                requested variable. Note that the ultimate choice
of the dialog
                is up to the client. The following are valid types
:

                text          allow the user to type in answer

                password      ask the question, allowing user to t
o typein in "blind" mode;
                              the response should be encrypted.
                inform        just display the detail information
for the specified
                              period of time without requiring use
r interaction.
                              No variable binding is expected.

                confirm       display the question for the specifi
ed
                              period of time, expecting ok or canc
el.
                              The result should be either "ok" or
"cancel".

                choose        display a list of options, and let t
he
                              user choose one. Treat default value
 as a comma-separated
                              list of choices.

                select        display a list of options, and let t
he
                              user choose some, all, or none of th
em.
                              Treat default as a comma-separated
                              list of choices, and return a comma-
separated
                              list of the selected items.
  -->

<!-- ===============================================================
=====  -->

<!ELEMENT special (var-def*) >

<!--

   A special element contains zero or more variable definitions.
The server
   sends a special element to provide the client with meta-informa
tion about
   the collection.  Variables bound within a special element might
 include:
        screenplays  list of screenplay mnemonics, in descending or
der of preference
                     For example, screenplays="slideshow thumbnails
 richochet" means
                     that the client should use the slideshow scree
nplay to display
                     the collection, if that screenplay is availabl
e.  If not, it
                     should try to use the thumbnails screenplay, a
nd so on.

        params       parameters passed to the screenplay, a set of
name=val
                     bindings.

        size         the size of the collection
                     when not specified, the collection is unbounde
d

        origin       sequencing origin; where to start in the colle
ction.
                     this option may be used by the server to trans
port
                     the sequence from one workstation to another

        idleratio    specifies how aggressively client should downl
oad the collection

                     After completing a download, client pauses bef
ore beginning the next
                     download.  The length of the pause is computed
 as

                         pause = idleratio * last_download_duration

                     where last_download_duration is the time neede
d to complete the most
                     recent succesful download.  idleratio is a non
negative number; the
                     smaller it is, the more aggressively the clien
t will attempt to download
                     the collection.
        increment    the increment for sequencing

                     Items are indexed starting with zero. The clie
nt may
                     sequence through the collection using the foll
owing formula:

                        i[ 0 ] = origin
                        i[ n ] = ( i[n-1] + increment ) MOD size
                        i[n-1] = ( i[n] - increment )        ... if
 i[n] >= increment ...
                        i[n-1] = ( i[n] - increment ) + size ... if
 i[n] <  increment ...


                     If i[n] is not materialized, it is skipped; th
e
                     client repeats this until an item has material
ized.

                     For example,

                     {origin=0,increment=1)           => sequential
scan
                     (origin=0,increment=largeprime) => random scan
 of entire set

-->

<!-- ============================================================
===== reports -->

<!ELEMENT reports (rprt-def) * >

<!--

   Reports are the primary method for a client to communicate with
 the
   server. The syntax for reports has been unified so that it can
   easily be extended for new uses.

-->
```

```
<!ELEMENT rprt-def (item-ref*) >
<!ATTLIST rprt-def type          NMTOKEN  #REQUIRED
                   options       CDATA    #IMPLIED>

<!--

   Items describe resources on the web. Each item has one or more
   facets, e.g., an associated thumbnail or an associated image. T
he
   idea is that we can extend the kinds of facets, e.g., to suppor
t
   sound files, quicktime movies, and so on, by adding new facets.

  A report definition may have a:

        type          what type of report, see below for a list

        options       specific options for this instance of the
report

  A report may have one or more item definitions or references.

-->

<!ELEMENT item-def (facet*)>
<!ATTLIST item-def id            CDATA    #REQUIRED
                   pos           NMTOKEN  #IMPLIED

                   title         CDATA    #IMPLIED
                   details       CDATA    #IMPLIED
                   page          CDATA    #IMPLIED
                   rating        CDATA    "0"
                   info          CDATA    #IMPLIED

                   fgcolor       CDATA    #IMPLIED
                   bgcolor       CDATA    #IMPLIED
                   hicolor       CDATA    #IMPLIED
                   uncolor       CDATA    #IMPLIED

                   relmod        NMTOKEN  #IMPLIED  >

<!ELEMENT item-ref EMPTY>
<!ATTLIST item-ref id            CDATA    #REQUIRED
```

```
                     note             CDATA    #IMPLIED
                     relmod           NMTOKEN  #IMPLIED >

<!ELEMENT facet      EMPTY>
<!ATTLIST facet      kind             CDATA    #REQUIRED
                     src              CDATA    #REQUIRED
                     info             CDATA    #IMPLIED
                     mimetype         CDATA    #IMPLIED >

<!--

  Attributes for items:

         id              unique identifier for this item

         pos             the position of the item within the collec
tion
                         default is one larger than the index of th
e
                         last materialized picture.

         title           the name of this item

         detail          the fine detials for this item
                         default is "Find out more about
                                     <a href=http://[serverhost]
                                        /pixxa/client/action/detail
-find?id=[item-id]
                                     >[item-title]</a>."

         page            the page to follow for this item
                         default is http:<a href=http://[serverhost
]
                                         /pixxa/client/action/page-
find?id=[item-id]

         rating          the rating for this item;
                         default is zero

         note            in item-ref marks the item with a specific
 note,
                         for exmple, what type of failure caused th
is
```

```
                              item to be in a problem report.

              fgcolor         foreground color (format: #rrggbb)
              bgcolor         background color (format: #rrggbb)
              hicolor         highlight color (format: #rrggbb)
              uncolor         disabled color (format: #rrggbb)

              relmod          the number of seconds between the latest r
        endezvous and when
                              this item was last changed. Suppose the cl
        ient
                              makes a change to the rating of an
                              item. Sometime later the client receives a
                              notification that the rating should change
                              again, reverting the rating back to
                              normal. (This may have been caused by the
                              user's use of another client, or just beca
        use
                              the server has stale information on this i
        tem
                              for whatever reason.)

                              In these cases, the client can find out
                              approximately when the item was changed in
                              client-local time (using relmod and the
                              client-local time of the latest rendezvous
        )
                              and then keep the rating change that happe
        ned
                              later.

            An item may contain zero or more facets. A facet describes a
            different presentation of the item. Each facet contains:

                kind          what type of facet, legal values include:
                                - thumb
                                - image
                                - logo
                                - flash
                                - sound

                src           the source url for the content of this fac
        et.
        info              kind-specific info about the facet (reserv
ed
                          for future use)

        mimetype          mime type for the content. If none is spec
ified
                          it is up to the client to decide.

        alt               alternative text for the facet. If no alt
                          is specified, the item-def's title must be
 used
                          as a default.


    Here is an example of an item-def:

     <item-def id="amazon_com"
               title="Amazon.com"
               details="Amazon.com: Earth's biggest bookstore."
               page="http://www.amazon.com" >

        <facet kind="thumb"
               src="http://www.amazon.com/g/associates/logos2000/1
26X32-b-logo.gif"
               mimetype="image/gif" />

        <facet kind="image"
               alt="Amazon.com Logo Image"
               src="http://www.amazon.com/g/associates/logos2000/1
49X45-b-logo.gif"
               mimetype="image/gif" />

     </item-def>

     In the case of the thumb facet, its alt uses the default, whi
ch is
     the title from the enclosing item-def.

-->


<!-- ======================================================== rep
```

```
ort types -->

<!--

  The following is a list of valid types for reports:

    rating
    duplicate_item_insert
    unknown_item_update
    unknown_item_delete
    update_conflict
    stale_item
    stale_everything
    unknown_item_referenced
    unknown_variable_referenced
    refreshed_item

-->

<!-- ======================================================  ratin
g reports -->

<!--

  A rating report indicates that the users' likes and dislikes.
  The options set to "-1", "+1" or "0" affect all items referenced
 in the
  report.

  <rprt-def type="rating" options="-1">
    <item-ref id=...>
  </rprt-def>

-->

<!-- ===================================================== manageme
nt reports -->

<!--

  Reports are sent by a client which has trouble performing certai
n
  item operations, for example, updating items.
  <rprt-def type="unknown_item_deleted">
    <item-ref id=...>
  </rprt-def>

  See the list of report types and different actions to find out
  more about problem reports.

-->

<!-- ====================================================== media failu
re reports -->

<!--

  When the client can't reach a media item, it marks the item to b
e reported in
  a "media failure" report in the next rendezvous.

  <rprt-def type="media_failure">
      <item id=... note="404 NotFound">
  </rprt-def>

  The note for the item carries the HTTP causing the media failure
,
  when possible.

-->

<!-- ======================================================  stale
 item reports -->

<!--

  Stale item reports are sent as part of client requests; the serv
er
  usually refreshes the entire value for the item. This is an unus
ual
  request by the client; there is evidently something wrong with t
he
  data gathered by the client.

  <rprt-def options="stale_item">
```

```
    <item-ref id=...>
  </rprt-def>

-->

<!-- =======================================  stale everything rep
orts -->

<!--

  The entire client cache is stale, invalid, or empty. Client shou
ld
  receive the entire collection for this particular user.

  <report type="stale_everything"/>

-->

<!-- =============================================== instances and
 blocks -->

<!ELEMENT instances (block+) >
<!ATTLIST instances extent (partial|complete) "complete">

<!ELEMENT block (facet* item-def*) >
<!ATTLIST block action    (insert|update|delete|define) "insert"
                fgcolor   CDATA    #IMPLIED
                bgcolor   CDATA    #IMPLIED
                hicolor   CDATA    #IMPLIED
                uncolor   CDATA    #IMPLIED>

<!-- This section describes the instance information on items.  A
server can
     ask a client to insert, update, delete, or define items withi
n the
     collection.

     To do that the server issues an instances statement, within w
hich are one
     or more blocks.  Each block in turn contains zero or more ite
m-defs, and
     its action attribute specifies the action to perform on all i
tems within
```

```
     the block.

     When the instances' extent is specified to be "complete", all
 the items
     of the collection are listed in the block; they can be define
d only
     within a block that has an "insert" action.  The client can a
ssume that any
     missing item has been deleted.

     Blocks are syntactical shorthand, a way of grouping items tha
t have
     common attribute values.  A block's attribute values are appl
ied to all
     items within it, except for those attributes that are overrid
den by
     individual items.

     The same rule applies to a block's facets:  whatever facets a
re defined
     within a block are shared by all of the block's items, though
 individual
     items may override a block's facet by defining a facet of the
 same kind.
     Block facets are especially useful for defining logos to be s
hared by many
     different items.

     It is an unchecked runtime error if two items with the same i
d are
     simultaneously in two blocks with the same action.

     When applying a block attribute value to an item is problemat
ic, the
     client will take appropriate actions (as defined below). It w
ill also mark
     the items in question in problem reports that are passed back
 to the server
     in the next rendezvous.
-->

<!-- ============================================ block actio
n="insert" -->
```

```
<!--

  When the server wants to insert a new media item in client's cac
he, it
  will issue a block statement with its action set to "insert".

  <block
   action="insert">
    <item
    id=[a item id]
    pos=...                       ...position within the collection.
..
    content=...
    name=...
    details=...
    target=....
    rating="-1"
    type="mime/jpeg"
    info="100x100 pix, 25k"      ...interpreted by the screenplay..
.
    />
  </block>

  If the same item already exists in the collection, then the clie
nt:
    - updates the values as per insert record
    - marks the item for report with type "duplicate_item_insert".

  If an item exists in this position then the client:
     - inserts the current record at the end of the collection
     - marks the item for report in the next rendezvous with type
       "index_collision"
-->

<!-- ================================================== block actio
n="update" -->

<!--

  The update element is useful for changing values associated with
 an
  image. In particular, you can change the content URL for a parti
```

```
cular
  image (to deal with re-organizations of external sites where ima
ges
  may live.) This is done by overriding the "content" element of t
he update
  record.

  <block
   action="update">
  <item-def id=[a item id]
    pos=
    content=...
    name=...
    details=...
    page=....
    thumb=...
    rating="-1"
    type="mime/jpeg"
    info="100x100 pix, 25k"
    relmod="25"
  />
  </block>

  If the item referred to by "id" doesn't exist,
  client must:
    - create the item
    - update its fields as specified in the transmission
    - mark item for report of type "unknown_item_update"

  If an item with a differnt id is located in the
  same position as specified by the update:
     - the position is set to the last item in the
       collection
     - the item is marked for report of type
       "index_collision"

  If the update conflicts with one made by the client (for example
,
  a rating change):
    - use the relmod + local time of rendezvous when we received t
his
      update to determine which took place later.
    - mark item for report of type "update_conflict"
```

```
-->

<!-- ====================================================== block actio
n="delete" -->

<!--

  By sending a block with action="delete", the server requests the
 client
  to delete a media item from the collection.

  <block
   action="delete">
    <item-def id=.../>
  </block>

  If the item doesn't exist, client marks it for report of type
  "unknown_item_delete".

-->

<!-- ====================================================== block actio
n="define" -->

<!--

  A define action is just like an insert action, with the followin
g
  exceptions:

  - it can only be used in the "provide" mode
  - it can only contain media items from URLs that are
    descendents of the parent URL of the PXP file. (This
    restriction makes it possible for people to create
    their own collections by creating a file or script
    on their own servers. However, these collections are
    static and cannot refer to other's contents.

-->

<!-- ============================================================= url
handling  -->
```

```
<!--
    URLs passed onto the client may be relative to the Pixxa serve
r,
    e.g., /client/customize?xyz=abc. When following this type of l
ink
    (for example, to start a browser) the client must append the
    protocol and the hostname of the server (e.g.,
    http://dev.pixxa.com) which it is currently corresponding.
    Also, the query pxp_email=[user's email] is appended to the
    server-relative URLs, so that /client/customize?xyz=abc maps t
o
    http://dev.pixxa.com/client/customize?xyz=abc&pxp_email=farsha
d@cmass.com

-->

<!-- ================================================== text h
andling  -->

<!--
    Because of a limitation of XML, all text sent down will be
    URL-encoded.

        - & for ampersand (&)
        - &quote; for double quotes (")

     These markups should be unescaped before text handed by the s
erver
     is processed by the client.

     So, if the original text is 1 & 2,
     the escaped text becomes 1 & 2
     and the client should eventually map this back to the origina
l form.

-->

<!-- ================================================ screenplay
parameters -->

<!--
```

```
     Screenplay parameters (specified as a var-def named "params"
within a
     special element) is a list of key-value bindings.

     The format for the screenplay parameters is the same as HTTP
query
     parameters. (Note that non-alphanumeric values may be URLenco
ded;
     also, since XML does not allow literals to carry ampersands
     they are replaced by the XML directive for ampersand .)

     The key "transition" can be bound to one of:

     wiperight
     wipeleft
     wipedown
     wipeup
     centerouth
     edgesinh
     centeroutv
     edgesinv
     centeroutsquare
     edgesinsquare
     pushleft
     pushright
     pushdown
     pushup
     revealup
     revealupr
     revealr
     revealdownr
     revealdown
     revealdownl
     revealleft
     revealupl
     dxpixelsfast
     dxboxyrect
     dxboxysquare
     dxpatterns
     randomrows
     randomcols
     coverdown
     coverdownl
```

```
        coverdownr
        coverleft
        coverright
        coverup
        coverupl
        coverupr
        venetian
        checkerboard
        stripbottoml
        stripbottomr
        stripleftdown
        stripleftup
        striprightdown
        striprightup
        striptopl
        striptopr
        zoomopen
        zoomclose
        vertblinds
        dxbitsfast
        dxpixels
        dxbits

        Not all clients may implement these transitions.
        Depending on the client, there may also be other
        parameters for the screenplay, for example, the
        duration of the transition.

   -->

   <!-- ===================================================== v3 rest
   rictions  -->

   <!--

     A valid v3 implementation of the protocol may place the followin
   g
     restrictions:

     1. rating specifications range from -1..0..+1.
     2. A media item id is the same as content URL, but neither the c
   lient
        nor the server can assume this.
```

```
  3. var-def's type may only be "text" and "password" and "inform"
  4. var-def password responses need not be encrypted
  5. Neither the client nor the server need to worry about
     server-side reports.

-->
```

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